

Anirudh Singhal

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EDUCATION

Indian Institute of Technology Bombay

Jul'16-Jun'21

- Dual Degree (B.Tech. + M.Tech.) in **Electrical Engineering**; CPI: **9.6/10** (4th among 70+ students)
- Minor Degree in **Computer Science and Engineering** with a Minor Degree CPI of 9.4/10

SCHOLASTIC ACHIEVEMENTS

- Awarded **Institute Academic Award** (given to 54 out of 3k+) for securing the highest SPI in AY 2019-2020 '20
- Selected to represent IIT Bombay (4 out of 900+) as an **exchange scholar** to attend a semester at **Technical University of Denmark** (DTU), during which attained a Semester Performance Index (SPI) of **10/10** '19
- Awarded **AP Grade** for stellar performance in Network Theory and **Markov Chains & Queuing Systems** '18,'19
- Secured an **All India Rank of 368** out of 150k candidates appearing in the **JEE Advanced** examination '16

WORK EXPERIENCE

Quantitative Strategist | Morgan Stanley

Jul'21-Present

Associate, Fixed Income Division, Morgan Stanley, Mumbai

- Exposed functionalities of Credit C++ Analytics Library used for pricing of all Credit Derivative products in Python
- Developed a Credit Default Swap (CDS) Option pricer using **Black Scholes** Model for pricing and risk calculation
- Implemented forward scenario pricing model for CDS options reducing time taken to generate sales reports by **8x**
- Developing a tool for pricing **CDS Index Tranches** using a Gaussian Copula Correlated Recovery (**GCCR**) model

PUBLICATIONS & PATENTS

Publication : *Query Complexity of k-NN Based Mode Estimation*; **A. Singhal**, S. Pirojiwala and N. Karamchandani; 2020 IEEE Information Theory Workshop (ITW)

Publication : *Towards a Unified Framework for Visual Compatibility Prediction*; **A. Singhal**, A. Chopra, K. Ayush, U. Patel and K. Balaji; 2020 IEEE Winter Conference on Applications of Computer Vision (WACV), Colorado, USA

Patent : *Deep Learning Based Visual Compatibility Prediction For Bundle Recommendations*

Filed in United States Patent and Trademark Office (**USPTO**) in May, 2020; Patent Number : US 16/865,572

INTERNSHIPS & KEY PROJECTS

Deep Learning Based Solutions for Fashion Compatibility | Adobe Systems

May'19-Jul'19

Research Intern, Media and Data Science Research Lab, Adobe Systems, Noida

- Outperformed the current state-of-the-art model by **7%** in measuring the compatibility of a set of clothing items
- Introduced a category conditioned **Graph Convolution Network** to model the category and context of the items
- Developed an **Attention based Autoencoder** for clustering the outfits in 6 clusters based on their fashion styles

Adaptive Mode Estimator for Continuous Distributions | Master's Thesis

Jan'20-Dec'20

Guide: Prof. Nikhil Karamchandani, Electrical Engineering

- Reduced no. of operations by **99%** in estimating mode of high-dimensional data by adaptive sampling of dimensions
- Proposed an **Information Theoretically** optimal algorithm that estimates the **kth nearest neighbour** of a point
- Showcased **optimality** of the algorithm by finding its upper and lower bounds, and proving they are of **same order**

Risk Analysis and Portfolio Optimization | DTU Management, Denmark

Aug'19-Nov'19

Guide: Prof. Nina Lange, Department of Management, Technical University of Denmark

- Designed the global minimum variance and **tangent portfolio** consisting of 8 stocks with and without short-selling
- Attained a return of **60.88%** with a risk of **0.42** and a Sharpe ratio of **1.42** for the tangent portfolio with shorting
- Employed **Fama-French** and **Capital Asset Pricing** models to interpret dependence of return on risk for portfolios

Software Development Intern | OkCredit, Bangalore

May'18-Jul'18

Developed an in-house app analytics service for OkCredit, a **startup** which provides a mobile based digital ledger

- Designed an infrastructure to collect the user interactions of **10k+ users** from a mobile app for product analytics
 - Built a stateless server in **Google Go** to store data in a Cassandra database and transfer it daily to **Amazon S3**
 - Created an **Android Library** to store user interaction data locally on the mobile phone and send it to the server
- Incorporated Google Sign-In as a ID provider in an Oauth 2.0 protocol based authentication service in Google Go

TECHNICAL SKILLS & EXTRA CURRICULARS

- **Programming** : Python , C++ , Google Go , MATLAB , TensorFlow , PyTorch , Numpy , SkLearn , Pandas
- **Teaching** : Selected as a teaching assistant for MA207 : Diff. Eqn. and EE325 : Prob. & Rand. Processes
- **Social Work** : Taught English to college kitchen staff as a part of **Adult Literacy Program (ALP)**, NSS
- **Travelling** : Backpacked across **15 European countries** and **25+ cities** in 4 months on a shoestring budget
- **Adventures** : Skiing in Zakopane, Poland; Trekking on Mt.Ulriken in Bergen, Norway; Mountaineering in J&K